

1. A composition of matter for use in the formation of alkaline earth-containing materials, comprising:

a compound comprising an alkaline earth metal beta-diketonate (and the isoelectronic derivatives thereof) and an amine, said compound being a liquid at 60 °C and capable of being vaporized.

2. A composition of matter for use in the formation of alkaline earth-containing materials, comprising:

a compound comprising an alkaline earth metal beta-diketonate (and the isoelectronic derivatives thereof) and an amine, said compound being a liquid at 20 °C and capable of being vaporized.

3. The composition of matter as in claim 1, wherein the beta-diketonate has the formula, ${}^1\text{RC}(=\text{O})\text{CHR}^3\text{C}(=\text{O})\text{R}^2$, where ${}^1\text{R}$ and R^2 are independently selected and are an alkyl group, a fluoroalkyl group, an alkyl group substituted by other elements, or an aryl group; and R^3 may be hydrogen, an alkyl group, a fluoroalkyl group, or an alkyl group substituted by other elements.

4. The composition of claim 3, wherein the groups ${}^1\text{R}$ and R^2 contain four or five carbons.

5. The composition of claim 3, wherein the group R^3 contains less than two carbons.

6. The composition of claims 4 or 5, wherein the beta-diketonate ligand is chosen from those listed in Table 1 of the specification.

7. The composition of matter as in claim 1 or 2, wherein the amine has the formula, $\text{R}^a\text{N}(\text{R}^b)\text{CH}_2\text{CH}_2\{\text{N}(\text{R}^c)\text{CH}_2\text{CH}_2\}_n\text{N}(\text{R}^d)\text{R}^e$, wherein R^a , R^b , R^c , R^d , and R^e are

independently selected and are hydrogen or an alkyl group, a fluoroalkyl group, an alkyl group containing oxygen- or nitrogen-containing species or an aryl group, and n is a non-negative integer.

- 5 8. The composition of matter as in claim 7, wherein n has the value 0, 1 or 2.
9. The composition of matter as in claim 7, wherein n has the value 1.
10. The composition of matter as in claim 7, wherein at least one of the groups R^a , R^b , R^c , R^d , and R^e contains more than one carbon atom.
11. The composition of matter as in claim 7, wherein the amine is selected from Table 2 of the specification.
- 15 12. The composition of matter as in claim 1, wherein the amine complex of a barium beta-diketonate is chosen from Table 4 of the specification.
13. The composition of matter as in claim 2, wherein the compound is chosen from Tables 3, 5, 6, 7 or 8 of the specification.
- 20 14. The composition of matter as in claim 1, wherein the compound has a solubility greater than 1 molar in a liquid solvent.
15. The composition of matter as in claim 1, wherein the compound has a
- 25 solubility greater than 0.5 molar in a liquid solvent.
16. A process for forming a material containing an alkaline-earth metal, comprising:

providing a liquid comprising a compound including an alkaline earth metal beta-diketonate (and the isoelectronic derivatives thereof) and an amine, and

contacting the liquid or its vapor with a heated surface in a deposition process to deposit a material containing an alkaline-earth metal.

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17. The process of claim 16 in which the deposited material comprises one or more metal oxides.

18. The process of claim 16 in which the metal or metals are selected from the group consisting of barium, strontium and titanium.

19. The process of claim 16 in which the metal or metals are selected from the group consisting of strontium, bismuth, niobium and tantalum.

20. The process of claim 16, wherein a sol-gel process is used to deposit material containing one or more metals or metal oxides.

21. The process of claim 16, wherein a spray-coating or spin-coating process is used to deposit material containing one or more metals or metal oxides.